

# Dingding YAO

Ph.D., A.P.

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**Date of Birth:** 03/09/1990      **Nationality:** Chinese      **Sex:** Female



## Education

- Sep. 2012-  
Dec. 2018      **Ph.D      Engineering      Energy and Environmental Engineering**  
Huazhong University of Science and Technology, China, supervised by Professor Haiping Yang and Professor Hanping Chen  
University of Leeds, UK, Joint doctoral training, Energy Research Institute, supervised by Professor Paul T. Williams  
Thesis title: Hydrogen rich syngas and carbon nanotubes production from pyrolysis-catalysis of waste plastics
- Sep. 2008-  
Jun. 2012      **B.S.      Engineering      Energy and Power Engineering**  
North China University of Water Resources and Electric Power, China, GPA: 4.1/5, Top 1%

## Work and Research Experience

- Feb.2021-  
Current      **Associate Professor      Huazhong Agriculture University      China**  
Research on thermo-chemical conversion of plastic and agriculture waste for valuable carbon products, also serve as graduate student supervisor, and undergraduate/graduate courses teacher
- Nov. 2018-  
Jan. 2021      **Postdoctoral Research Fellow      National University of Singapore      Singapore**  
Developing sustainable solutions to treat municipal solid waste, funded by project Energy and Environmental Sustainability Solutions for Megacities (E2S2), supported by the National Research Foundation (NRF) under its CREATE programme
- Nov. 2016-  
Nov. 2017      **Visiting Researcher      University of Leeds      UK**  
Flexible pyrolysis-catalysis processing of waste plastics for selective production of high value products, within University of Leeds supported by the RISE Project (643322); as part of the Marie Sklodowska-Curie Action: H2020-MSCA-RISE-2014
- Sep. 2014-  
Sep. 2018      **PhD research on catalytic pyrolysis of waste plastics**  
Project was supported by China-UK Cooperation Foundation of State Key Laboratory of Coal Combustion (FSKLCCB1610), and National Natural Science Foundation of China (51376076)
- Sep. 2012-  
Aug. 2014      **Research Assistant working on thermochemical conversion of biomass and bio-oil**  
Within Huazhong University of Science and Technology, project was supported by National Natural Science Foundation of China (51376076 and 51306066)

## Research Interests

Thermo-chemical processing of solid waste (biomass, waste plastic)  
Catalyst material development and characterizations      Carbon nanomaterials synthesis and application

## Publications

1. Ruofan Cui, Mui-Choo Jopng, Luhua You, Feijian Mao, **Dingding Yao**, Karina Yew-Hoong Gin, Yiliang He. Size-dependent adsorption of waterborne Benzophenone-3 on microplastics and its desorption under simulated gastrointestinal conditions. *Chemosphere*. 2022, 286:131735.

2. **Dingding Yao**, He Li, Yanjun Dai, Chi-Hwa Wang. Impact of temperature on the activity of Fe-Ni catalysts for pyrolysis and decomposition processing of plastic waste. *Chemical Engineering Journal*. 2021, 408:127268.
3. **Dingding Yao**, Haiping Yang, Qiang Hu, Yingquan Chen, Hanping Chen, Paul T Williams. Carbon nanotubes from post-consumer waste plastics: Investigations into catalyst metal and support material characteristics. *Applied Catalysis B: Environmental*. 2021, 280:119413.
4. **Dingding Yao**, He Li, Babu Cadiam Mohan, Arun Kumar Prabhakar, Yanjun Dai, Chi-Hwa Wang. Conversion of waste plastic packings to carbon nanomaterials: investigation into catalyst material, waste type, and product application. Submitted to *ACS Sustainable Chemistry and Engineering* in 2021.
5. Yuhan Yang, Tiancheng Wang, Hongyun Hu, **Dingding Yao**, Chan Zou, Kai Xu, Xian Li, Hong Yao. *Renewable Energy*. 2021,180:616-625.
6. Yeshui Zhang, Hualun Zhu, **Dingding Yao**, Paul T Williams, Chunfei Wu, Dan Xu, Qiang Hu, George Manos, Lu Yu, Ming Zhao, Paul Shearing, Dan Brett. Thermo-chemical conversion of carbonaceous waste for CNT and hydrogen productions: A review. *Sustainable Energy & Fuels*. 2021.
7. Hua Tang, Hongyun Hu, Aijun Li, Baojun Yi, Xian Li, **Dingding Yao**, Hong Yao, Haoran Yuan. Removal of impurities from waste tire pyrolysis char using the molten salt thermal treatment, *Fuel*. 2021,301:121019.
8. Juniza Md. Saad, Paul T. Williams, Ye Shui Zhang, **Dingding Yao**, Haiping Yang, Hui Zhou, Comparison of waste plastics pyrolysis under nitrogen and carbon dioxide atmospheres: A thermogravimetric and kinetic study. *Journal of Analytical and Applied Pyrolysis*. 2021,156:105135.
9. **Dingding Yao**, Chi-Hwa Wang. Pyrolysis and in-line catalytic decomposition of polypropylene to carbon nanomaterials and hydrogen over Fe-and Ni-based catalysts. *Applied Energy*. 2020, 265:114819.
10. Qiang Hu, Ziyue Tang, **Dingding Yao\***, Haiping Yang\*, Jingai Shao, Hanping Chen, Thermal behavior, kinetics and gas evolution characteristics for the co-pyrolysis of real-world plastic and tyre wastes. *Journal of Cleaner Production*. 2020: 121102. (Corresponding author)
11. Ning Cai, Haiping Yang, Xiong Zhang, Sunwen Xia, **Dingding Yao**, Pietro Bartocci, Francesco Fantozzi, Yingquan Chen, Hanping Chen, Paul T. Williams. Bimetallic carbon nanotube encapsulated Fe-Ni catalysts from fast pyrolysis of waste plastics and their oxygen reduction properties. *Waste Management*. 2020, 109: 119-126.
12. Daqian Wang, Bin Li, Haiping Yang, Chuang Zhao, **Dingding Yao**, Hanping Chen. Influence of biochar on the steam reforming of biomass volatiles: effects of activation temperature and atmosphere. *Energy & Fuels*. 2019, 33: 2328-2334
13. **Dingding Yao**, Yeshui Zhang, Paul T. Williams, Haiping Yang, Hanping Chen. Co-production of hydrogen and carbon nanotubes from real-world waste plastics: Influence of catalyst composition and operational parameters. *Applied Catalysis B: Environmental*. 2018, 221:584-591. (**Highly cited paper**)
14. **Dingding Yao**, Haiping Yang, Hanping Chen, Paul T. Williams. Co-precipitation, impregnation and so-gel preparation of Ni catalysts for pyrolysis-catalytic steam reforming of waste plastics. *Applied Catalysis B: Environmental*. 2018, 239:565-577.
15. **Dingding Yao**, Haiping Yang, Hanping Chen, Paul T. Williams. Investigation of nickel-impregnated zeolite catalysts for hydrogen/syngas production from the catalytic reforming of waste polyethylene. *Applied Catalysis B: Environmental*. 2018, 227:477-487.
16. Qiang Hu, **Dingding Yao**, Yingpu Xie, Youjian Zhu, Haiping Yang, Yingquan Chen, Hanping Chen. Study on intrinsic reaction behavior and kinetics during reduction of iron ore pellets by utilization of biochar. *Energy Conversion and Management*. 2018, 158: 1-8.
17. **Dingding Yao**, Chunfei Wu, Haiping Yang, Yeshui Zhang, Mohamad A. Nahil, Yingquan Chen, Paul T. Williams, Hanping Chen. Co-production of hydrogen and carbon nanotubes from catalytic pyrolysis of waste plastics on Ni-Fe bimetallic catalyst. *Energy Conversion and Management*. 2017, 148:692-700.
18. **Dingding Yao**, Qiang Hu, Daqian Wang, Haiping Yang, Chunfei Wu, Xianhua Wang, Hanping Chen. Hydrogen production from biomass gasification using biochar as a catalyst/support. *Bioresource Technology*. 2016, 216:159-64.
19. Qiang Hu, Haiping Yang, **Dingding Yao**, Danchen Zhu, Xianhua Wang, Jingai Shao, Hanping Chen. The densification

- of bio-char: Effect of pyrolysis temperature on the qualities of pellets. *Bioresource Technology*. 2016, 200: 521-527.
20. Qiang Hu, Jingai Shao, Haiping Yang, **Dingding Yao**, Xianhua Wang, Hanping Chen. Effects of binders on the properties of bio-char pellets. *Applied Energy*. 2015, 157: 508-516.
21. **Dingding Yao**, Chunfei Wu, Haiping Yang, Qiang Hu, Mohamad A. Nahil, Hanping Chen, Paul T. Williams. Hydrogen production from catalytic reforming of the aqueous fraction of pyrolysis bio-oil with modified Ni–Al catalysts. *International Journal of Hydrogen Energy*. 2014, 39(27): 14642-14652.

## Conference Presentations

1. Dingding Yao. Thermal chemical recycling of waste plastics for valuable products. *Sustainable Waste Management Workshop*. 7-9 January 2020. Singapore. (**Invited speaker**)
2. Dingding Yao. Co-production of H<sub>2</sub> and carbon nanotubes from waste plastics with bimetallic Ni-Fe catalyst. *6<sup>th</sup> International Conference on Biomass Energy*. 16-19 October 2018. Wuhan, China. (Poster)
3. Dingding Yao. Syngas and high value carbon nanomaterials production from pyrolysis-catalysis of waste plastics with Ni based catalyst. *2018 Symposium on Solid Waste & Biomass: Thermal Chemical Conversion*. 7-8 April 2018. Xi'an, China. (Oral presentation)
4. Dingding Yao. Production of hydrogen and high value carbon nanomaterials from pyrolysis-catalysis of waste plastics. *6<sup>th</sup> Sino-Australian Symposium on Advanced Coal and Biomass Utilisation Technologies*. 4-8 December 2017. Perth, Australia. (Oral presentation)
5. Dingding Yao. Hydrogen and high value carbon nanomaterials production from solid wastes. *Workshop on Pyrolysis and Gasification of Wastes*. 30-31 March 2017. Hull, UK. (Oral presentation)
6. Dingding Yao. Co-production of hydrogen and carbon nanotubes from catalytic pyrolysis of waste plastics on bimetallic catalyst. *21<sup>st</sup> International Symposium on Analytical and Applied Pyrolysis*. 8-12 May 2016. Nancy, France. (Oral presentation)
7. Dingding Yao. Hydrogen-rich production from biomass gasification on Ni/Al catalyst with in situ CO<sub>2</sub> capture in a two-stage fixed bed reactor. *4<sup>th</sup> International Conference on Biomass Energy Technologies*. 17-19 October 2014. Changsha, China. (Oral presentation)
8. Dingding Yao. Catalytic gasification of biomass with biochar: the interaction between volatiles, biochar and Ni. *5<sup>th</sup> Sino-Australian Symposium on Advanced Coal and Biomass Utilization Technologies*. 14-16 December 2015. Wuhan, China. (Poster)

## Teaching and Supervision

- 2021-current. Teaching undergraduate/graduate courses (Combustion Technology; Technical Writing) at Huazhong Agriculture University
- 2021-current. Master student supervision (4 students) at Huazhong Agriculture University
- 2019-2020. Co-supervision of MSc. students at National University of Singapore for their final projects

## Funds and Scholarships

1. National Natural Science Foundation of China (5210060936), PI, 2021-2024, CNY 240,000
2. Fundamental Research Funds for the Central Universities (510321005), PI, 2021-2024, CNY 250,000
3. Short-term Academic Visit fund from HUST, 2016, CNY 30,000
4. Foundation of State Key Laboratory of Coal Combustion for International Collaboration (FSKLCCB1610), co-PI, 2015, CNY 100,000
5. National Scholarship 2014 for Post-graduate Students, CNY 20,000

## Honors and Awards

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- 2018. First Prize of the Best Poster Presentation in the 6<sup>th</sup> International Conference on Biomass Energy
- 2016. Excellent Students Awards Huazhong University of Science and Technology
- 2014. Excellent Paper Award Third Prize. The 4<sup>th</sup> International Conference on Biomass Energy Technologies

## Professional Activities

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- Organizing committee of 2019 E2S2-CREATE and AIChE Waste Management Conference. March 11-13, 2019, Singapore; Sustainable Waste Management Workshop, January 7-9, 2020, Singapore
- Reviewer of Journal of Cleaner Production, Renewable & Sustainable Energy Reviews, Chemical Engineering Journal, Energy Conversion and management, Chemical Engineering Science, Journal of Analytical and Applied Pyrolysis, Industrial & Engineering Chemistry Research, Process Safety and Environmental Protection, Journal of the Energy Institute, etc.